MCIH

Intcal Series

INTELLIGENT FIELD CALIBRATOR FOR TC & RTD SIGNALS **TM 10**

Intcal TM - 10 FEATURES

VARIETIES OF INPUTS AND OUTPUTS: Intcal TM-10 simulates eight types of Thermocouples , Pt-100, Millivolt and Resistance and simultaneously measures Standard Instrumentation signals such as 4-20mA,0-20mA,0-2V,1-5V and 0-10V.Temperatures of T/C and RTD points can be read directly in °C or °F . It can power Two wire Transmitters inTx-pwr mode.

CALIBRATED COLD JUNCTION SENSOR: Intcal TM-10 is supplied with a calibrated temperature sensor probe to sense the terminal temperature of instrument under calibration. This uniquefeatures provide realistic and near ideal cold junction compensation at RealTime.

LOGGING OF FIELD DATA FOR CALIBRATION REPORT: At field Intcal TM-10 can log calibration data of upto 36 Field instruments along with instrument identification data like Tag no, Sl.no.etc .Later it can down load this to a PC to generate calibration report using the software TMDB-10

STABLE PERFORMANCE OVER WIDE AMBIENT TEMPERATURE: Careful selection of critical components ensures Intcal TM-10 to have the highest performance stability at extreme ambient conditions that prevail in the field.

USER PROGRAMMABLE FULL SCALE AND ZERO: Zero and Full scale can be programmed for the selected thermocouple / RTD as this makes calibration easier.

MEMORY STEPPING and SINGLE KEY FUNCTIONS: Each source has eleven non volatile memory locations to user programmed settings .The source can output them in sequence to ease calibration / linearity check.Setting source output to range maximum or minimum of any selected range is done with single key stroke to make calibration less tiresome.

About Intcal TM 10.....

Intelligent field calibrator Intcal **TM-10** from MCIH is high Precision calibrator designed mainly for **TEMPERATURE INSTRUMENT CALIBRATION** .It has Versatile features for calibrator and checking Temperature Transmitters, Temperature Indicators, Recorders and Conditioners with T/C and RTD input. Intcal TM 10 simulates signals of ANSI standard Thermocouples ,PT-100 RTD.It can also source millivolt signals for load cell amplifiers and can simulates resistances for position indicators. Additionally the instrument can read Thermocouple,PT-100 RTD outputs and also can measure standard high level output signal for Transmitters and signal conditioning instruments.Intcal TM 10 can automate Lab calibration together with application software TMDB-10, when linked to a IBM PC.

Intcal TM-10 is a portable instrument with internal rechargeable batteries. Intcal TM-10 does three prime tasks of SOURCING , MEASURING and LOGGING of calibration data all at a time under the supervision of a microprocessor. Every Intcal TM-10 is calibrated with standards whose uncertainties are traceable to national standards and thus suits the requirements for ISO 9000 implementation .The calibration of Intcal TM –10 is made tamper proof with password protection to offer highest calibration reliability.

CAPABLITIES AT A GLANCE

Temperature Transmitter Calibration The Temperature Transmitter under calibration is being powered by Intcal TM-10 set to 'TxPWR'mode. The source is set to simulate Type K Thermocouple as per setting made in° C or ° F and the same is fed as input to transmitter . The Cold Junction probe is sensing the ambient temperature around the transmitter to give real Time cold junction Compensation .No need to refer to tables! No need to monitor Room Temperature to adjust the mV feed! The 4-20mA outputs is simultaneously measured by Intcal TM-10 in percentage mode.

Signal Conditioner Calibration The Signal Conditioner under calibration receives Pt-100 input, simulated by Intcal TM –10.The output1-5V of the conditioner is being measured by meter side of Intcal TM 10.Direct temperature entry in ° C or ° F remove hassles of referring to RTD table and turning the resistance box knobs. Repeatable resistance outputs, free from contact resistance changes, over any number of trials is the biggest advantage.

Temp.Indicators / Recorder Calibration Intcal TM 10 is simulating K-Type Thermocouple to calibrate the indicator / Recorder. The calibrated cold junction is sensing the terminal temperature of the instrument under calibration thus providing realistic cold junction compensation .Zero and Full scale inputs required by the instrument(s) under calibration are readily simulated with single key stroke making calibration procedure much simple.

Temperature Measurement at field Intcal TM-10 is measuring the temperature of a process point by monitoring thre resistance output of the Pt-100RTD directly at field .The temperature is read in °C or °F . In case of a T/C, connection represented by the dotted line in the illustration is to be removed .The compensating cable is to be terminated at the terminals of Intcal TM-10 and the temperature around the terminals of Intcal-TM10 will be measured by Cold Junction for cold junction compensation.

Automatic Documented Field Calibration Doing field calibration is no longer cumbersome job with Intcal TM-10 in your hands. the Logger mode paves way for Automatic Documented Calibration even at field and thus eliminates the conventional manual ways of using pen and paper.

Intcal TM-10 can store 40 sets of calibration data (each set is called a page) while performing a field calibration in Logger Mode. The data thus logged can be up loaded to a Personal Computer at Instrument Lab to enable Intcal TM-10 do further logging .The data thus up loaded are processed by TMDB-10,the Application Software, to generate calibration reports and various useful presentations.

SPEEDY & SYSTEMATIC SHOP CALIBRATION....

TMDB -10.The Application Software: TMDM-10, the application software can make your shop calibration systematic, well documented and simple to do, with its user friendly features. When Intcal TM –10 is linked to PC through the RS 232 Port, The feature packed TMDB-10 accelerates your shop calibration .During Computer Aided Calibration PC takes control over IntcalTM-10, and the monitor in the first phase displays two animated Deviation Indicators, one showing the Zero Error and the other showing the full scale Error of the under calibration .The deviation indicators indicate the deviation in real time and in % to enable easier error assessment of the instrument under calibration .The effect of adjusting Zero or Full scale of the instrument under calibration is reflected immediately in the monitor by the Error indicator a making fine adjustments simpler than one ever imagines. There is provisions for the checking the linearity of the instrument under calibration before trying to log the data .A Separate Linearity indicator and a input feed indicator are available for this purpose at the flip of a key .Once the performance of the instrument is with in the limits of error,TMDB -10 in the second phase automatically performs a five point calibration check and the store the data in the database along with the instrument identification data like Tag no, Location ,Model no, Instrument range, report format etc .The data base is a standard database compatible with most commonly used database Languages like DBASE, FOXBASE,FOXPRO,CLIPPER etc. This Feature is helpful to those who are interested in making data transfer to their centralized MIS system and also for the ones who would like to format the print outs in different ways than being offered by us.

The user can access the calibration the calibration data to get Calibration reports , Comparison graphs etc., at anytime using the exhaustive menu offered by TMDB-10.

OPERATIONAL SPECIFICATION

SOURCE MODE

Output impedance
T/C and mV mode : 50 mΩ.

Excitation limits
RTD / Ohms mode : 100µA to 2mA.

Output Protection
Voltage output : upto ± 10 V DC max.

METER MODE

Input Impedance
T/C and mV mode : 10 MΩ.

Excitation current
RTD / Ohms mode : 400µA

Input Protection
Voltage mode : upto ±10V DC max.

GENERAL SPECIFICATIONS

Display	: 5 character Alpha Numeric LCD 6.45x10.75mm character size.	**Dimensions**	: 21 cm(W) x 9(H) x 23(D)
Backlight	: LED Backlight	**Material**	: Industrial ABS enclosure
Signal I/O	: 4 mm Banana sockets	**Operating Temp.**	: 0 to 40°C
Power supply	: 12V 2Ahr battery,	**Storage Temp.**	: 0 to 60°C
		Humidity	: 0 - 95% Non condensing

CHARGE TIME/LIFE

Time taken for full charge	:	14 to 16 hrs with the charger provided.
Battery charge life	:	5 Hrs.

STANDARD ACCESSORIES

- ✦Probes
- ✦Main Adaptor
- ✦Fuse Pack
- ✦RS - 232 Cable
- ✦User Manual
- ✦Carrying Case
- ✦Traceability Certificate
- ✦Report Generation Software (TMDB - 10)
- ✦Calibrated Cold Junction Probes

PERFORMANCE SPECIFICATIONS

Model T7542

SOURCE

Type & Range	Resol	Accuracy[1]
Type K (-270 ºC to 1372 ºC)	0.1 ºC	
-218 ºC to -158 ºC		±0.4 ºC
-158 ºC to 950 ºC		±0.2 ºC
950 ºC to1370 ºC		±0.4 ºC
Type J (-210 ºC to 760 ºC)	0.1 ºC	
-200 ºC to -100 ºC		±0.2 ºC
-100 ºC to 390 ºC		±0.1 ºC
390 ºC to 760 ºC		±0.2 ºC
Type T (-270 ºC to 400 ºC)	0.1 ºC	
-244 ºC to -152 ºC		±0.6 ºC
-152 ºC to 400 ºC		±0.2 ºC
Type E (-270 ºC to 1000 ºC)	0.1 ºC	
-242 ºC to -204 ºC		±0.4 ºC
-204 ºC to1000 ºC		±0.2 ºC
Type R (0 ºC to 1768 ºC)	0.1 ºC	
70 ºC to 840 ºC		±0.6 ºC
840 ºC to1380 ºC		±0.4 ºC
1390 ºC to1762 ºC		±0.6 ºC
Type S (0 ºC to 1768 ºC)	0.1 ºC	
70 ºC to1760 ºC		±0.6 ºC
Type B (50 ºC to 1820 ºC)	0.1 ºC	
360 ºC to 690 ºC		±0.9 ºC
690 ºC to1732 ºC		±0.4 ºC
Type N (-270 ºC to 1300 ºC)	0.1 ºC	
-220 ºC to -94 ºC		±0.6 ºC
-94 ºC to1010 ºC		±0.2 ºC
1010 ºC to1300 ºC		±0.4 ºC
Pt-100 DIN 43760	0.1 ºC	
-200 ºC to 850 ºC		±0.2 ºC
Ohms		
0 to 400Ω	0.01 Ω	±0.05% of FS[2]
T/C Types[3]		
J, K, E, T , R, S, B, C, N.0.1 ºC	± 0.04 mV[4]	
RTD[3]		
Pt100 (385), Pt100 (392), Ni 120.0.1 ºC±0.2 Ω		
m V		
-10 to 80mV	1mV	±0.01 % of setting ±4mV
-10 to 200mV	10mV	±0.01 % of setting ±10V
Resistance		
0 to 400 Ω[2]	0.01Ω	±0.005 % of setting ±0.03 Ω
0 to 2KΩ[3]	0.1Ω	±0.02 % of setting ±0.1 Ω

1. Add ±0.1ºC for cold junction error.
2. At excitation current of 1mA ±10%
3. At excitation current of 0.1 mA ±10%

METER

Type & Range	Resol	Accuracy [1]
mA & TX-Powering	0.001%	
0 to 20MA		±0.01 % of F.S
4 to 20		
Voltage		
1 to 5V	0.1mV	±0.01 % of F.S
0 to 10V	1mV	
0 to 2V	0.1mV	
mV Measurement	0.01mV	±0.02 % of Rdg + 2 digit
-10V to 200mV		
Resistance		
0 to 400Ω	0.01Ω	±0.06 Ω
RTD	0.1ºC	
Pt - 100 (DIN 43760) -200 to 850 ºC		±0.3 ºC
Type K (-270 ºC to 1372 ºC)	0.1ºC	
-100ºCto900ºC		±0.6 ºC
900ºCto 1300ºC		±0.8 ºC
Type J (-210 ºC to 760 ºC)	0.1ºC	
-190ºCto0ºC		±0.8 ºC
0ºCto 760ºC		±0.4 ºC
Type T (-270 ºC to 400 ºC)	0.1ºC	
-230ºCto-180ºC		± 2 ºC
-180ºCto 0ºC		± 1 ºC
0ºCto 400ºC		±0.5 ºC
Type E (-270 ºC to 1000 ºC)	0.1ºC	
-200ºCto-60ºC		±0.8 ºC
-60ºCto 1000ºC		±0.4 ºC
Type R (0 ºC to 1768 ºC)	0.1ºC	
300ºCto1760ºC		± 2 ºC
Type S (0 ºC to 1768 ºC)	0.1ºC	
70ºCto1760ºC		± 2 ºC
Type B (50 ºC to 1820 ºC)	0.1ºC	
300ºCto 1000ºC		± 5 ºC
1000ºCto 1730ºC		± 2 ºC
Type N (-270 ºC to 1300 ºC)	0.1 ºC	
-100ºCto0ºC		± 1 ºC
0ºCto 1000 ºC		±0.6 ºC
1000ºCto1300ºC		±0.8 ºC

4. Accuracy is computed as ±0.01% of setting in mV ± 4mV
5. Accuracy is computed as ±0.02% of reading in mV ± 20mV

ORDERING INFORAMATION

Model : Intcal TM - 10 : 0.01 % Accurate documenting calibrator for T/C, RTD signals

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Specifications are subject to change without any notice due to continuous development.